

Circuits Lab due Thursday

1. In 8 groups get

A board with 3 resistors, 8 wires, 1 voltmeter, 1 ammeter, 2 batteries

2. Measure the voltage and current through each resistor (label R_1 R_2 R_3) and through the battery

** series*

a) individually b) in series c) in parallel

d) Mix? - R_1 in series with $R_2 + R_3$ in parallel

e) Calculate $R = V/I$ for each resistor and for the whole circuit. Calculate the %error for R_t for each circuit.

3. Write a report with purpose, hypothesis (Ohms law, resistor equations, voltage and current), procedure (include circuit diagrams with voltmeter and ammeter placement), observations, calculations, conclusion, sources of uncertainty.

Sample data table: set to 200mA 200V

	V(V)	I(A)	$V_1(V)$	$V_2(V)$	$V_3(V)$	$I_1(A)$	$I_2(A)$	$I_3(A)$
ind.	 							
ser.								
Par.								

Mix?

calculations:

$$R_1 = V_1 / I_1 = ______ R_2 = ______ = ______ R_3 = ______ = ______$$

$$R_{\text{tseries}} = V / I ______ = ______ \% \text{error} = ______ = ______$$

$$R_{\text{tparallel}} = ______ = ______$$

$$\% \text{error} = ______ = ______$$

$$\% \text{error} = |\text{theoretical} - \text{experimental}| / \text{theo}$$

If your data doesn't work or you run out of time, go to

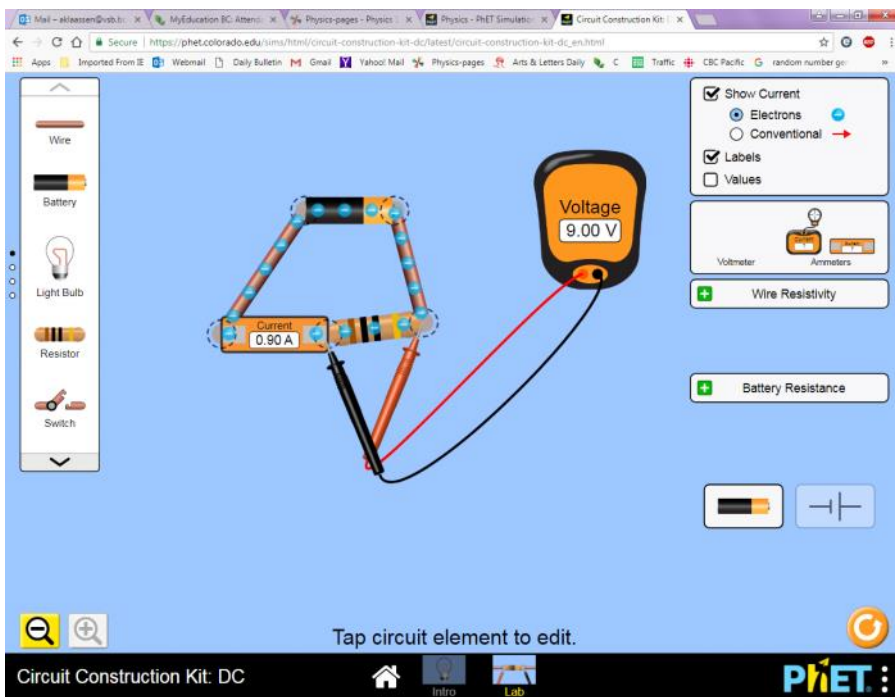
<https://phet.colorado.edu/en/simulation/circuit-construction-kit-dc>

redo/supplement data using the online simulation individually at home

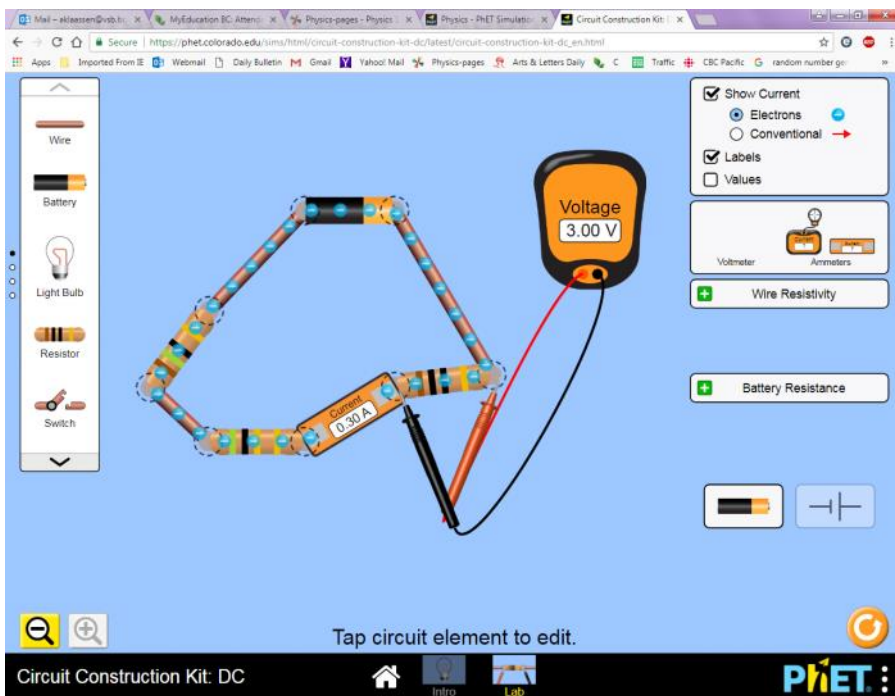
individual - make each resistor different by double clicking on it and move slider



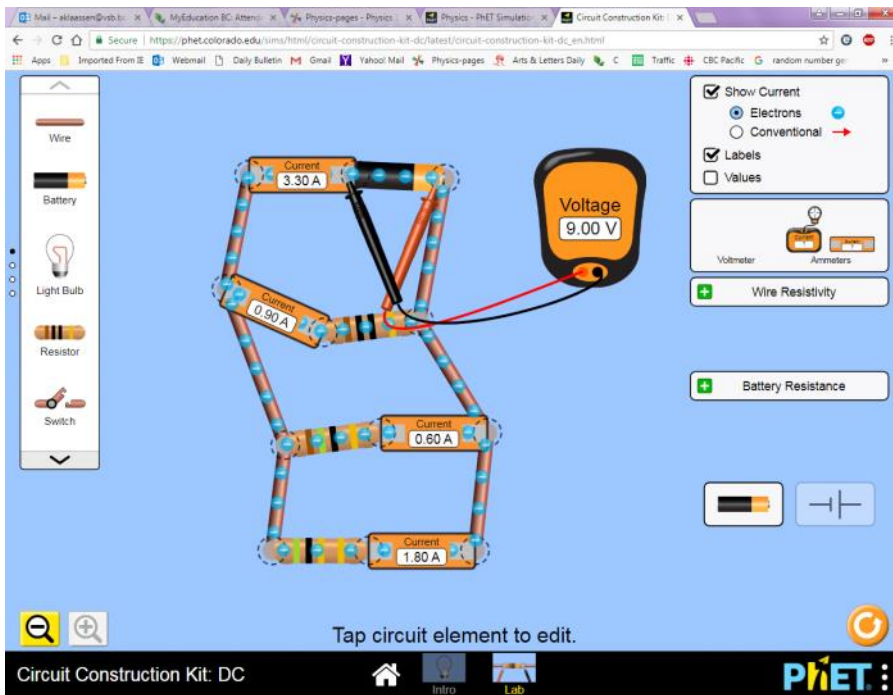
Individual:



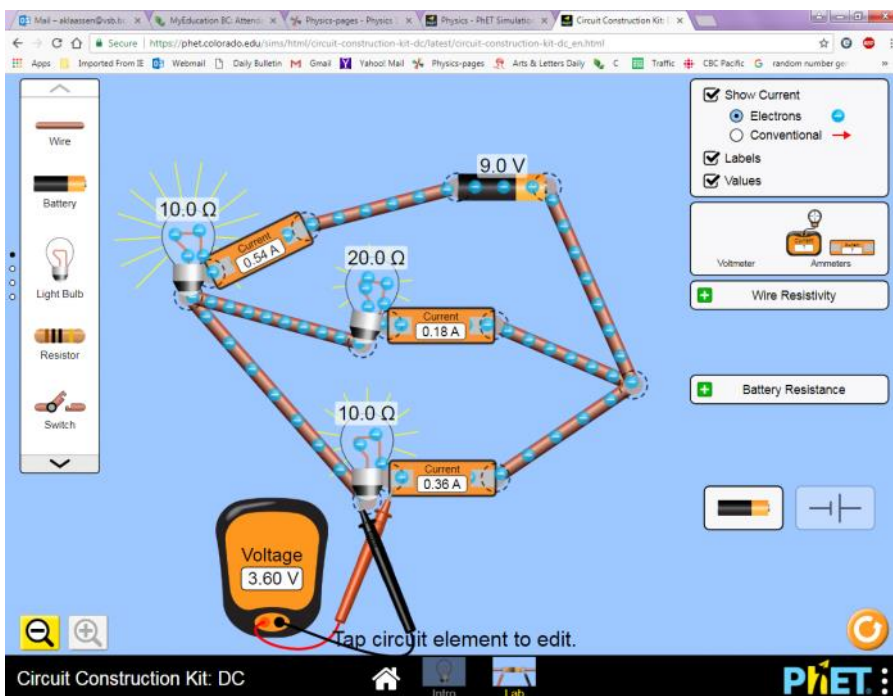
Series:



parallel:



mixed:



Which light bulb is brighter? Why?